Cervical cytology in genital infection

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It is now accepted practice to take smears for Papanicolaou staining from female patients attending clinics for the treatment of sexually-transmitted diseases as there is a high incidence of abnormality in these women (Wachtel, 1973). These smears have also been found useful for identifying *Trichomonas vaginalis*, *Herpes simplex*, and to a lesser extent *Candida albicans* (Thin, Atia, Parker, Nicol, and Canti, 1975).

An increased incidence of inflammatory changes in the epithelial cells in cervical smears has been reported in female contacts of men with non-specific urethritis (NSU) (Simmons and Vosmik, 1974). The purpose of this paper is to report the results of an investigation into the incidence of inflammatory changes in cervical smears taken from women with gonorrhoea, trichomoniasis and candidiasis.

Methods

Cervical smears were obtained with an Ayre's spatula and immediately wet-fixed in ether/alcohol. They were stained by the Papanicolaou method and examined 'blind' by an experienced cytologist. This was part of the routine investigation of patients, which included full clinical examination, and bacteriological investigation by smears and cultures for *N. gonorrhoeae*, *T. vaginalis*, and *C. albicans*. Serological tests for syphilis were also carried out (Simmons and Vosmik, 1974). The cytological criteria for inflammatory changes in a cervical smear were based mainly on the altered morphology of the epithelial cells (Wachtel, 1969). The number of leucocytes was considered to be an unreliable criterion for grading inflammatory change in view of variations between individuals and with the phases of the menstrual cycle; nevertheless a marked excess of white cells was not entirely ignored when assessing the inflammatory reaction. The degree of inflammatory change was graded on an arbitrary scale (see below) and was assessed mainly on the frequency of parabasal cells (evidence of reactive hyperplasia) together with atypical and degenerative changes in these cells. Patients with any sexually-acquired disease as well as the one under consideration were excluded from the study. For comparison, smears were taken from subjects attending the clinic during the same period who were not found to have any evidence of sexually-transmitted disease after full assessment and investigation.

They were matched for age, marital status, parity, and ethnic group and will be described as 'controls'.

Simmons and Vosmik (1974) reported their observations of cytological inflammatory change using an arbitrary scale —, ±, +, ++, +++. The findings obtained in this study were originally reported on the same scale, but preliminary examination and calculation showed that categories — and ± could be amalgamated without affecting the results. This has been done and the combined group is labelled '—'.

Results

(a) Inflammatory changes in patients with gonorrhoea

There were 41 patients with gonorrhoea, whose ages ranged from 17 to 50 yrs (mean 24.4). Thirty were single and eleven were married, 39 were white and two were negro.

Inflammatory changes were reported in 25 (60.9 per cent.) patients and in six (14.6 per cent.) controls (Table I). This difference is highly significant at the 0.1 per cent. level. The Table shows that eight of the patients, but none of the controls had marked inflammation (+++, +++).

TABLE I Inflammatory changes in patients with gonorrhoea

Inflammation	—	+	++	+++
Patients	16	17	7	1
Controls	35	6	0	0

$\chi^2_1 = 16.8$; $P < 0.001^*$

*Comparison of negatives against all positives

(b) Inflammatory changes in patients with trichomoniasis

Eighty patients with trichomoniasis were studied, whose ages ranged from 17 to 47 yrs (mean 28.4); 54 were single, 24 were married and two were widowed; 75 were white and five were negro.

Cervical smears showed inflammatory changes in 72 (90.0 per cent.) patients and in ten (12.5 per cent.) controls (Table II). The difference is significant at the 0.1 per cent. level. The Table shows that 34 of the patients but none of the controls showed severe degrees of inflammation (+++, +++).

TABLE II *Inflammatory changes in patients with trichomoniasis*

Inflammation	—	+	++	+++
Patients	8	38	22	12
Controls	70	10	0	0

 $\chi^2_1 = 93.1$; $P < 0.001$ *

*Comparison of negatives against all positives

(c) Inflammatory changes in patients with candidosis

There were 82 patients with candidosis whose ages ranged from 16 to 38 yrs (mean 22.3); 63 were single and nineteen were married; 81 were white, and one was negro. Inflammatory changes were reported in 29 (35.4 per cent.) patients and in seventeen (20.7 per cent.) controls (Table III). The difference is significant only at the 6 per cent. level, but there were more patients than controls in each inflammation category.

TABLE III *Inflammatory changes in patients with candidosis*

Inflammation	—	+	++	+++
Patients	53	22	6	1
Controls	65	14	3	0

 $\chi^2_1 = 3.7$; $P = 0.06$ *

*Comparison of negatives against all positives

Discussion

These results show that women with gonorrhoea and with trichomoniasis often show marked inflammatory changes in the epithelial cells of the cervical Papanicolaou-stained smear, but the changes are less marked in women with candidiasis. This correlates well with the clinical appearance of the cervix which often looks inflamed in women with gonorrhoea and trichomoniasis, but is rarely inflamed in the presence of uncomplicated candidosis. Simmons and Vosmik (1974) reported inflammatory changes in a small group of women who were contacts of men with NSU and suggested that the presence of such changes might

help with the difficult clinical problem of recognizing non-specific genital infection in these women. Burns, Darougar, Thin, Lothian, and Nicol (1975) also found inflammatory changes in women who were contacts of men with NSU. The present study indicates that, before attributing the presence of cytological inflammatory changes to non-specific genital infection, it is important to exclude gonorrhoea, trichomoniasis, and, to a lesser extent, candidosis.

Summary

Papanicolaou-stained cervical smears taken from 203 female patients with either gonorrhoea, trichomoniasis, or candidosis were examined for the degree of inflammatory change. The results from these patients were compared with the results of smears taken from women who had no evidence of sexually-acquired infection after full assessment in the clinic.

Gonorrhoea and trichomoniasis were associated with inflammatory changes but these were less marked in patients with candidosis. It is concluded that, before cytological inflammatory changes are attributed to non-specific genital infection, it is important to exclude gonorrhoea, trichomoniasis, and, to a lesser extent, candidosis.

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